

Today's Topics:

NASA Prediction Bulletin Format
NASA Prediction Bulletins

Date: Sat, 28 Oct 89 19:34:02 EDT
From: tkelso@afit-ab.arpa (TS Kelso)
Subject: NASA Prediction Bulletin Format

As a service to the satellite user community, the following description of the NASA Prediction Bulletin's two-line orbital element set format is uploaded to sci.space on a monthly basis. The most current orbital elements from the NASA Prediction Bulletins are carried on the Celestial RCP/M, (513) 427-0674, and are updated several times weekly. Documentation and tracking software are also available on this system. The Celestial RCP/M may be accessed 24 hours/day at 300, 1200, or 2400 baud using 8 data bits, 1 stop bit, no parity.

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Data for each satellite consists of three lines in the following format:

AAAAAAAAAAAA

1 NNNNNNU NNNNNAAAA NNNNN.NNNNNNNNN +.NNNNNNNNN +NNNNNN-N +NNNNNN-N N NNNNN
2 NNNNN NNN.NNNNN NNN.NNNNN NNNNNNNNN NNN.NNNNN NNN.NNNNN NN.NNNNNNNNNNNNNNN

Line 1 is a eleven-character name.

Lines 2 and 3 are the standard Two-Line Orbital Element Set Format identical to that used by NASA and NORAD. The format description is:

Line 2

Column	Description
01-01	Line Number of Element Data
03-07	Satellite Number
10-11	International Designator (Last two digits of launch year)
12-14	International Designator (Launch number of the year)
15-17	International Designator (Piece of launch)
19-20	Epoch Year (Last two digits of year)
21-32	Epoch (Julian Day and fractional portion of the day)
34-43	First Time Derivative of the Mean Motion
	or Ballistic Coefficient (Depending on ephemeris type)
45-52	Second Time Derivative of Mean Motion (decimal point assumed; blank if N/A)
54-61	BSTAR drag term if GP4 general perturbation theory was used. Otherwise, radiation pressure coefficient. (Decimal point assumed)

63-63 Ephemeris type
65-68 Element number
69-69 Check Sum (Modulo 10)
(Letters, blanks, periods = 0; minus sign = 1; plus sign = 2)

Line 3

Column	Description
01-01	Line Number of Element Data
03-07	Satellite Number
09-16	Inclination [Degrees]
18-25	Right Ascension of the Ascending Node [Degrees]
27-33	Eccentricity (decimal point assumed)
35-42	Argument of Perigee [Degrees]
44-51	Mean Anomaly [Degrees]
53-63	Mean Motion [Revs per day]
64-68	Revolution number at epoch [Revs]
69-69	Check Sum (Modulo 10)

All other columns are blank or fixed.

Example:

NOAA 6
1 11416U 86 50.28438588 0.00000140 67960-4 0 5293
2 11416 98.5105 69.3305 0012788 63.2828 296.9658 14.24899292346978

Note that the International Designator fields are usually blank, as issued in the NASA Prediction Bulletins.

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Date: Sat, 28 Oct 89 19:33:37 EDT
From: tkelso@afit-ab.arpa (TS Kelso)
Subject: NASA Prediction Bulletins

The most current orbital elements from the NASA Prediction Bulletins are carried on the Celestial RCP/M, (513) 427-0674, and are updated several times weekly. Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space. This week's elements are provided below. The Celestial RCP/M may be accessed 24 hours/day at 300, 1200, or 2400 baud using 8 data bits, 1 stop bit, no parity.

- Current NASA Prediction Bulletins #593 -

Alouette 1

1 00424U 89288.13049099 0.00000290 33831-3 0 2376
 2 00424 80.4656 167.6470 0022506 181.0979 179.0138 13.67213047349203

SOLRAD R/B

1 00727U 64001 A 89293.73703022 .00000387 00000-0 32554-3 0 3109
 2 00727 69.9082 186.9386 0015663 288.7848 71.1538 13.93603746310583

Cos 185 R/B

1 03019U 67104 B 89295.84861632 .00013560 00000-0 92156-3 0 4741
 2 03019 64.0396 68.8233 0204768 211.7594 147.1067 14.91084411124106

ATS 3

1 03029U 67111 A 89294.27379357 -.00000074 00000-0 99999-4 0 2629
 2 03029 12.9005 23.1466 0017044 200.2858 159.6253 1.00272530 80409

Cosmos 398

1 04966U 71 16 A 89297.34064181 .00039325 15456-5 24452-3 0 1925
 2 04966 51.5219 92.6156 2449893 76.5182 309.4818 10.67607202566064

Starlette

1 07646U 89297.57791331 -.00000012 00000-0 37922-4 0 9951
 2 07646 49.8237 8.1317 0206386 133.2297 228.6033 13.82123198743196

LAGEOS

1 08820U 89297.12554539 .00000005 00000-0 00000 0 0 9092
 2 08820 109.8472 274.2486 0044850 288.5286 71.0634 6.38664173 58866

GOES 2

1 10061U 89296.41462973 -.00000003 0 3196
 2 10061 7.4746 66.6390 0007332 171.4032 188.6202 1.00273018 6668

GPS-0001

1 10684U 89295.10023882 0.00000010 10000-3 0 2511
 2 10684 63.7023 96.8822 0112658 197.8685 161.7700 2.00559628 71078

GPS-0002

1 10893U 89296.06101026 -.00000027 0 495
 2 10893 64.4752 337.7402 0154992 27.6677 333.2127 2.00552869 83911

GOES 3

1 10953U 89291.47937100 0.00000087 10000-3 0 7578
 2 10953 6.3361 70.0227 0005111 316.0011 43.7946 1.00280321 2177

SeaSat 1

1 10967U 78064 A 89296.65308622 .00001947 00000-0 72633-3 0 1845
 2 10967 108.0066 192.2865 0002165 275.3674 84.7251 14.34960129592515

GPS-0003

1 11054U 89296.36885115 -.00000026 0 1137
 2 11054 64.0134 334.1162 0055491 120.5208 240.0905 2.00563440 80937

GPS-0004

1 11141U 89295.96680370 0.00000010 0 2240
 2 11141 63.6087 96.7840 0055890 319.5668 40.0329 2.00567263 79622

NOAA 6

1 11416U 79 57 A 89296.53605337 .00001795 00000-0 76598-3 0 9177
 2 11416 98.5165 289.9604 0012743 91.8608 268.4047 14.26105544536193

GPS-0005

1 11690U 89295.10446709 0.00000011 0 8620
 2 11690 64.0916 98.7609 0108875 203.1569 156.3640 2.00558531 85466

Solar Max

1 11703U 80 14 A 89297.47546077 .00260677 00000-0 13626-2 0 1563
2 11703 28.4992 72.4425 0006415 29.9187 329.7343 15.78941718540083

GPS-0006

1 11783U 89295.42596004 -.00000026 0 9811
2 11783 63.8163 333.7684 0143224 61.7185 299.7799 2.00570235 69558

GOES 4

1 11964U 80 74 A 89293.83114591 -.00000050 00000-0 00000 0 0 944
2 11964 5.8172 72.0871 0033063 100.9263 259.4741 0.99228645 3276

GOES 5

1 12472U 89291.32392278 -.00000249 10000-3 0 7673
2 12472 2.8511 79.0051 0002082 188.2058 171.8611 1.00263274 29822

SME

1 12887U 81100 A 89296.64708494 .00032715 00000-0 98188-3 0 3474
2 12887 97.6749 327.3463 0002899 106.7495 253.4158 15.34384405444814

Meteor 2-08

1 13113U 89292.48907368 0.00000269 23199-3 0 6714
2 13113 82.5413 319.9677 0016816 71.6117 288.6880 13.84062147382437

Salyut 7

1 13138U 89299.35304632 0.00023943 46817-3 0 8379
2 13138 51.6086 32.7202 0000296 321.1503 38.9503 15.47304082428468

LandSat 4

1 13367U 82 72 A 89297.80066315 .00001145 00000-0 26430-3 0 1455
2 13367 98.1981 359.5294 0003250 134.1338 226.0077 14.57115218387027

Meteor 2-09

1 13718U 89293.06066351 0.00000771 39922-3 0 8270
2 13718 81.2462 159.3880 0056773 4.5710 355.5978 14.13338053353198

IRAS

1 13777U 89280.48282262 0.00000505 37564-3 0 6833
2 13777 99.0372 116.0263 0013171 8.6058 351.5316 13.98651051 11618

Cosmos 1447

1 13916U 83 21 A 89297.18344628 .00000238 00000-0 24095-3 0 6561
2 13916 82.9495 186.5071 0039841 76.5351 284.0243 13.73965913330263

TDRS 1

1 13969U 83 26 B 89295.32225480 -.00000207 00000-0 00000 0 0 8567
2 13969 3.8949 67.5741 0005686 137.1074 223.1460 1.00273303 90692

GOES 6

1 14050U 89294.51683401 0.00000116 0 278
2 14050 1.6207 80.4776 0001852 179.3673 180.7579 1.00284100 7877

OSCAR 10

1 14129U 89295.83948156 -.00000100 0 4359
2 14129 25.9220 237.9341 6030613 86.9960 336.1703 2.05883801 19845

GPS-0008

1 14189U 89295.01624025 0.00000009 10000-3 0 6704
2 14189 63.2431 95.3508 0138996 215.3064 143.7891 2.00564331 45984

Meteor 2-10

1 14452U 89290.17339746 0.00001122 47643-3 0 7804
2 14452 81.1659 171.2881 0095747 104.6867 256.4948 14.22370434309886

LandSat 5

1 14780U 84 21 A 89297.82915786 .00001359 00000-0 31115-3 0 9583
2 14780 98.1525 357.4840 0002502 171.4698 188.6460 14.57146509300444

UOSAT 2

1 14781U 89295.17851012 0.00003217 61922-3 0 5327
2 14781 97.9887 350.2343 0012349 284.7109 75.2749 14.64195621301121

LDEF

1 14898U 84 34 B 89297.45119175 .00072024 00000-0 77064-3 0 215
2 14898 28.5060 339.4894 0000847 219.2276 140.6157 15.62418771311608

GPS-0009

1 15039U 89296.07400854 0.00000008 0 7499
2 15039 62.9955 94.5449 0015458 243.2120 116.6384 2.00563425 39286

Cosmos 1574

1 15055U 84 62 A 89295.83736455 .00000234 00000-0 24075-3 0 7921
2 15055 82.9533 237.2261 0026279 265.8579 93.9576 13.73282584267499

Meteor 2-11

1 15099U 89294.99758383 0.00000184 15706-3 0 9723
2 15099 82.5265 265.5085 0011640 242.9738 117.0233 13.83715856267652

GPS-0010

1 15271U 89295.97361353 -.00000026 0 7205
2 15271 63.3183 333.4498 0102882 321.6625 37.6714 2.00569046 36393

Cosmos 1602

1 15331U 84105 A 89297.77785736 .00005206 00000-0 74453-3 0 1021
2 15331 82.5404 218.7742 0025447 26.0300 334.2228 14.76271891273330

NOAA 9

1 15427U 89293.90095236 0.00001028 57991-3 0 4432
2 15427 99.1551 283.3972 0014792 324.3132 35.7066 14.12227094250192

Meteor 2-12

1 15516U 89291.85370671 0.00000679 59868-3 0 1244
2 15516 82.5370 206.3844 0017560 124.6953 235.5850 13.84190643238168

Cosmos 1686

1 16095U 89297.93209839 0.00036204 70387-3 0 3951
2 16095 51.6070 39.7430 0001244 5.9965 353.9531 15.47247637229348

GPS-0011

1 16129U 89295.63211386 0.00000009 0 3599
2 16129 63.7752 95.3551 0120865 149.7267 210.9912 2.00562128 29592

Meteor 3-1

1 16191U 89291.59437207 0.00000043 10000-3 0 8678
2 16191 82.5480 148.5075 0020131 354.1208 5.9663 13.16880059191761

Meteor 2-13

1 16408U 89292.00599121 0.00000246 21123-3 0 5388
2 16408 82.5341 121.1491 0016243 318.8400 41.1535 13.84224200192684

Mir

1 16609U 89299.33878462 0.00048670 65139-3 0 1599
2 16609 51.6200 65.1456 0014449 254.3965 105.6087 15.57396424211626

SPOT 1

1 16613U 86 19 A 89297.80477300 -.00000076 00000-0 -27136-4 0 6451
2 16613 98.7273 10.6583 0001594 125.6035 234.5235 14.20021885 30524

Meteor 2-14

1 16735U 89292.00135554 0.00000328 28451-3 0 3297
2 16735 82.5392 148.0383 0015658 27.5504 332.6476 13.83980882171581

Cosmos 1766

1 16881U 86 55 A 89297.43989129 .00005112 00000-0 73604-3 0 7752
2 16881 82.5196 278.4484 0024101 43.7409 316.5699 14.76000877174358

EGP

1 16908U 86 61 A 89294.94488932 -.00000038 00000-0 75548-5 0 1543
2 16908 50.0122 268.4139 0010803 306.2994 53.6842 12.44381492145190

FO-12

1 16909U 89280.46642003 -.00000025 10000-3 0 1732
2 16909 50.0162 313.1889 0010955 268.6628 91.2950 12.44401240143389

NOAA 10

1 16969U 89297.51875662 0.00000969 44506-3 0 2961
2 16969 98.6295 325.5055 0012714 233.5954 126.4053 14.23238325162332

Meteor 2-15

1 17290U 89296.79176702 0.00000343 29968-3 0 2991
2 17290 82.4644 50.6205 0011638 264.6556 95.3300 13.83777189141404

MOS-1

1 17527U 87 18 A 89297.79507131 .00000379 00000-0 30706-3 0 2917
2 17527 99.1367 8.0671 0001008 79.1600 280.9671 13.94868389136443

GOES 7

1 17561U 89293.19149743 -.00000107 0 3563
2 17561 0.0099 300.9979 0004809 243.2910 175.7432 1.00270006 3018

Kvant

1 17845U 89297.99116066 0.00042447 57084-3 0 8938
2 17845 51.6190 71.9054 0016988 239.7437 119.9561 15.57281554147683

DMSF B5D2-3

1 18123U 87 53 A 89296.97403068 .00001147 00000-0 62747-3 0 4086
2 18123 98.8218 125.7443 0014588 338.2012 21.8545 14.13628297121028

RS-10/11

1 18129U 89298.86234537 0.00000150 15335-3 0 9215
2 18129 82.9252 141.6512 0012971 52.4503 307.7844 13.72017384117312

Cosmos 1867

1 18187U 87 60 A 89297.76738250 .00000225 00000-0 12335-3 0 9872
2 18187 65.0147 20.8729 0016969 252.6972 107.2248 14.29433114119649

Meteor 2-16

1 18312U 89294.03347387 0.00000219 18868-3 0 3272
2 18312 82.5538 119.8388 0011203 200.2896 159.7813 13.83531976109910

Meteor 2-17

1 18820U 89291.63719085 0.00000502 44017-3 0 1635
2 18820 82.5467 182.4509 0015807 286.6569 73.2857 13.84226716 86764

DMSF B5D2-4

1 18822U 88 6 A 89297.01107830 .00001288 00000-0 61152-3 0 3089
2 18822 98.6762 175.5431 0005832 231.5684 128.4977 14.20995679 89270

A0-13

1 19216U 89290.09120728 0.00000482 37172+0 0 508
2 19216 57.1143 186.3015 6814391 213.3923 73.7401 2.09694922 10298

OKEAN 1

1 19274U 88 56 A 89297.81351013 .000004794 000000-0 69793-3 0 5398
2 19274 82.5202 16.7253 0022706 167.0100 193.1568 14.75543328 70192

Meteor 3-2

1 19336U 89297.88847137 0.000000391 10000-2 0 2889
2 19336 82.5430 83.9099 0015753 178.8680 181.2425 13.16864181 59986

NOAA 11

1 19531U 89297.81737017 .000001366 000000-0 77711-3 0 1521
2 19531 98.9517 241.3024 0011332 224.5641 135.4605 14.11229213 55752

TDRS 2

1 19548U 88 91 B 89296.38658310 .000000132 000000-0 99999-4 0 458
2 19548 0.0140 233.3160 0003444 320.0742 166.6198 1.00277209 3070

Cosmos 2001

1 19796U 89298.41706026 -.000001057 -11803-2 0 2435
2 19796 62.8938 123.5773 7206122 319.4566 4.9172 2.00644141 5091

GPS-0014

1 19802U 89281.68171902 0.000000016 10000-3 0 544
2 19802 55.0882 207.3326 0063992 158.0327 202.2596 2.00559422 4704

Meteor 2-18

1 19851U 89295.08883703 0.000000117 10000-3 0 841
2 19851 82.5211 58.1499 0013824 317.5322 42.4767 13.83853006 32633

TDRS 3

1 19883U 89 21 B 89290.04165570 -.000000234 000000-0 99999-4 0 333
2 19883 0.0328 263.4283 0006148 337.4358 118.9390 1.00261505 1455

GPS-0013

1 20061U 89280.87090057 -.000000030 0 355
2 20061 54.6429 26.0899 0082887 167.3155 192.9165 2.00568920 2430

1989 059A

1 20149U 89278.04998095 0.000000135 13598-3 0 419
2 20149 82.9399 35.3073 0033253 77.6848 282.8026 13.72435355 9842

GPS-0015

1 20185U 89 64 A 89289.81659672 0.000000015 000000-0 99999-4 0 203
2 20185 54.9606 207.9099 0025466 138.9915 221.2270 2.00572510 5815

Progress M

1 20191U 89 66 A 89296.83608901 .00037587 000000-0 50857-3 0 574
2 20191 51.6202 77.6867 0014190 247.1300 112.7922 15.57227601 9643

1989 067B

1 20194U 89271.08542268 0.00377454 40599-4 14920-2 0 437
2 20194 26.7067 268.3099 0114214 148.0929 212.6614 15.75899851 4889

Cosmos 2037

1 20196U 89274.66879707 -.000000111 -77540-3 0 449
2 20196 73.5661 299.8346 0026255 226.2381 133.6497 12.40435505 4302

1989 068B

1 20197U 89271.27536897 -.000000007 0 80
2 20197 73.5678 304.3743 0024860 231.5958 128.2853 12.40689206 3880

Soyuz TM-8

1 20218U 89 71 A 89296.77191302 .00039567 000000-0 53537-3 0 517
2 20218 51.6213 78.0117 0013001 245.3534 114.5470 15.57221172 7482

1989 070B									
1	20230U		89281.14783252	0.00025402		36974-2	0	283	
2	20230	28.5780	306.7099	7396837	198.2548	104.7424	2.15322956	5982	
Cosmos 2038									
1	20232U		89281.75302871	0.00000004			0	173	
2	20232	82.5760	151.8987	0012169	336.4613	23.5922	12.65098274	3070	
Cosmos 2039									
1	20233U		89281.73787093	0.00000004			0	119	
2	20233	82.5823	151.9023	0015723	329.1459	30.8712	12.65887701	3078	
Cosmos 2040									
1	20234U		89281.72800311	0.00000004			0	129	
2	20234	82.5882	152.0261	0003943	108.7809	251.3714	12.62282515	3061	
Cosmos 2041									
1	20235U		89292.05013247	0.00000004			0	155	
2	20235	82.5847	145.3491	0009140	321.2705	38.7731	12.64510000	4382	
Cosmos 2042									
1	20236U		89281.69740463	0.00000004			0	139	
2	20236	82.5840	151.9910	0005700	336.7975	23.2859	12.63874149	3074	
Cosmos 2043									
1	20237U		89292.00979109	0.00000004			0	149	
2	20237	82.5780	145.4095	0002358	6.9061	353.2063	12.63091135	4360	
1989 074G									
1	20238U		89281.70542533	0.00000004			0	119	
2	20238	82.5945	152.2587	0040583	149.1863	211.1618	12.55208456	3058	
1989 077A									
1	20253U		89297.82071484	-.00000151		10000-3	0	308	
2	20253	4.9623	305.4801	0000923	168.9189	190.8448	1.00282052	290	
1989 077B									
1	20254U		89297.89764251	0.00096104	22246-4	32411-2	0	589	
2	20254	28.4420	306.9277	7207613	198.3478	107.8148	2.41585142	725	
Molniya1-76									
1	20255U		89298.70010097	0.00000690		12071-1	0	362	
2	20255	62.8137	171.6162	7356181	288.2443	9.5582	2.00647107	599	
1989 078B									
1	20256U		89299.23374591	0.13799275	42989-4	24516-3	0	740	
2	20256	62.8052	66.9312	0025738	121.7385	238.1190	16.44993496	4529	
1989 078C									
1	20257U		89297.30600474	0.23904803	43496-4	39607-3	0	713	
2	20257	62.8096	74.5113	0025323	105.0164	255.8269	16.45472312	4222	
1989 078D									
1	20258U		89296.85282225	0.00000291		74449-3	0	167	
2	20258	62.7893	171.7169	7312708	288.1735	9.8142	2.06171125	557	
Cosmos 2046									
1	20259U		89299.34638319	0.00012491		20935-3	0	632	
2	20259	65.0337	189.5290	0009615	266.7347	93.2663	15.52116620	4455	
InterCos 24									
1	20261U		89299.33149781	0.00005114		16114-2	0	822	
2	20261	82.6006	16.8961	1263956	146.5695	222.2024	12.42590606	3534	

1989 080C
1 20262U 89292.32274935 0.00002234 70120-3 0 430
2 20262 82.6007 21.3306 1263854 162.3649 202.5848 12.42634082 2667
Gorizont 19
1 20263U 89298.40113639 -.00000259 10000-3 0 357
2 20263 1.3861 275.9381 0001917 282.3857 76.8933 1.00284573 288
1989 081D
1 20266U 89289.38265415 -.00000320 10000-3 0 97
2 20266 1.4209 276.0434 0032752 308.5196 50.3836 1.00609906 209
Cosmos 2047
1 20279U 89299.32395717 0.01224708 27801-4 22502-3 0 759
2 20279 67.1125 146.0917 0156778 98.6447 263.2907 16.05938745 3677
Maigon-2
1 20281U 89299.33050388 0.00003591 11254-2 0 779
2 20281 82.5997 16.8906 1264325 146.5792 222.1994 12.42648566 3536
Cosmos 2048
1 20292U 89299.06260377 0.00171368 14372-4 10259-3 0 250
2 20292 62.8139 137.3512 0043213 147.3582 213.0444 16.15864921 1373
1989 083C
1 20294U 89290.96417205 0.01408787 14751-2 14558-2 0 24
2 20294 62.8044 169.4304 0008886 259.8309 100.1383 16.10636997 66
1989 084C
1 20299U 89297.62321595 0.00005954 32178-2 0 75
2 20299 34.2062 144.4305 7094715 6.2227 359.3986 2.49475524 144
GPS-0016
1 20302U 89298.49689650 -.00000031 10000-3 0 34
2 20302 54.7778 326.6200 0056573 1.9899 358.0891 1.99090310 48
1989 085B
1 20303U 89297.05989663 0.00005581 73504-3 0 68
2 20303 35.6480 307.2547 0337766 121.2161 242.2095 14.47094167 388
1989 085C
1 20304U 89298.18711703 0.00225194 14401-4 23034-2 0 120
2 20304 37.6944 320.5476 6052488 200.8123 116.7880 4.06808412 161
1989 086A
1 20305U 89298.64555004 0.00003167 83495-2 0 83
2 20305 82.5581 23.4209 0016383 190.2018 169.8755 13.15840364 100
1989 086B
1 20306U 89298.64544838 0.00003489 91711-2 0 51
2 20306 82.5582 23.4204 0016208 190.4164 169.6581 13.16036189 105
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End of INFO-HAMS Digest V89 Issue #818
